

ABSTRACT OF THE DISCLOSURE

In capacitive sensor circuits where physical contact is required and excess pressure may be inadvertently applied to the sensor surface, aluminum is not sufficiently hard to provide "scratch" protection and may delaminate, causing circuit failure, even if passivation integrity remains intact. Because hard passivation layers alone provide insufficient scratch resistance, at least the capacitive electrodes and preferably all metallization levels within the sensor circuit in the region of the capacitive electrodes between the surface and the active regions of the substrate are formed of a conductive material having a hardness greater than that of aluminum. The selected conductive material preferably has a hardness which is at least as great as the lowest hardness for any interlevel dielectric or passivation material employed. The selected conductive material is employed for each metallization level between the surface and the active regions, including contacts and vias, landing pads, interconnects, capacitive electrodes, and electrostatic discharge protection lines. Tungsten is a suitable conductive material, for which existing processes may be substituted in place of aluminum metallization processes.